

## STEP-BY-STEP CALCULATION OF PRELIMINARY 1996 CALIFORNIA POSTCONSUMER PAPER UTILIZATION RATE<sup>1</sup>

Listed below are the steps used to calculate the preliminary 1996 California postconsumer paper utilization rate. The data used in this attachment is essentially the same as that in Attachment 3, except that much of the data in Attachment 3 is rounded to two decimal places. Due to the rounding, many of the figures are slightly different in Attachment 3 than this one. The figures in this attachment are the "official" figures.

Calculation of the preliminary 1996 utilization rate is preceded by calculation of the 1990 tonnage of paper generated in California because that figure is used as a "baseline" for extrapolating 1996 California paper generation, which is the denominator of the formula for determining the 1996 utilization rate.

Data sources used for the following calculation are available by calling Brian Foran of the California Integrated Waste Management Board at 916-255-2467.

### 1990 CALIFORNIA POSTCONSUMER PAPER GENERATED (U.S. tons)

#### 1990 CALIFORNIA POSTCONSUMER PAPER RECOVERED

##### Preconsumer Scrap Factoring

(1)	1990 U.S. New Supply Paper/Paperboard	86,796,000
(2)	Preconsumer Scrap as % of New Supply	X 9.405%
(3)	Tons Preconsumer Scrap Generated	8,163,164
(4)	% of Preconsumer Scrap Recovered	X 94.22%
(5)	Tons Preconsumer Scrap Recovered	7,691,333
(6)	1990 Total U.S. Recovered Paper	+ 29,095,000
(7)	Preconsumer Scrap Recovered as % of Total Paper Recovered	= 26.44%

##### Mill Consumption

(8)	1990 Mountain & Pacific (M&P) States' Paper Mill Recovered Paper Consumption:	3,725,500
(9)	Preconsumer Scrap as a % of M&P States' Paper Mill Recovered Paper Consumption <sup>2</sup>	X 26.44%
(10)	M&P State Paper Mill Preconsumer Scrap Consumption	985,022
(11)	M&P State Paper Mill Postconsumer Paper Consumption: (8) - (10) =	2,740,478
(12)	M&P State Paper Mill Postconsumer Paper Consumption Originating from California, (based on population only):	
	(11) X 29,904,000 (Calif. Population) =	1,595,003
	51,380,000 (M&P States Pop., less AK & HI)	

<sup>1</sup> Some figures do not equal corresponding figures in Attachment 3 due to rounding.

<sup>2</sup> This step assumes the same percentage as identified in Step 7.

- (13) 1990 M&P State Paper Mill Postconsumer Paper Consumption Originating from California, (based on both population & recycling infrastructure):

$$[12] \times \left[ .5 \frac{(CC_{CA}/CC_{MP})}{(P_{CA}/P_{MP})} + .5 \frac{(MC_{CA}/MC_{MP})}{(P_{CA}/P_{MP})} \right] =$$

where: MPMC<sub>CA</sub> = CA recovered paper consumed at Mountain & Pacific State mills (estimate, based on population)  
 CC<sub>CA</sub> = CA population with access to curbside collection  
 CC<sub>MP</sub> = Mountain & Pacific States population with access to curbside collection  
 P<sub>CA</sub> = CA population  
 P<sub>MP</sub> = Mountain & Pacific States population (less AK & HI)  
 MC<sub>CA</sub> = California mill consumption of recovered paper (less preconsumer scrap)  
 MC<sub>MP</sub> = Mountain & Pacific States mill consumption of recovered paper (less preconsumer scrap)

$$1,595,003 \times \left[ .5 \frac{(6,475,000/9,635,000)}{(29,904,000/51,380,000)} + .5 \frac{(1,483,703/2,740,610)}{(29,904,000/51,380,000)} \right] =$$

$$1,595,003 \times [.5 (.691/.582) + .5 (.541/.582)] =$$

$$1,595,003 \times [.594 + .465] = 1,595,740 \times 1.059 = 1,689,108$$

#### Alternative Products

- (14) 1990 California Postconsumer Recovered Paper Utilized in Alternative Products 84,415

#### Exports

- (15) 1990 Total California Recovered Paper Exports 2,068,200  
 (16) Percentage of California Paper Exports Originating Outside of California<sup>3</sup> X 15%  
 (17) Recovered Paper Exports Originating outside of California 310,230  
 (18) Recovered Paper Exports Originating within California: [(15) - (17)] = 1,757,970  
 (19) Preconsumer Scrap as % of Recovered Paper Exports Originating in California<sup>4</sup> X 26.44%  
 (20) Preconsumer Paper Exports Originating Within California 464,807  
 (21) Postconsumer Paper Exports Originating Within California: [(18) - (20)] = 1,293,163

#### 1990 California Postconsumer Paper Recovered

- (22) 1990 California Postconsumer Paper Recovered: [(13) + (14) + (21)] = 3,066,686

<sup>3</sup> As estimated by Board staff, based on informal survey of seven major paper exporters in State.

<sup>4</sup> Assumes the same percentage calculated in Step 7

### 1990 CALIFORNIA TOTAL PAPER DISPOSED

(23)	1990 California Paper Disposal <sup>5</sup>	11,360,878
(24)	Preconsumer Scrap Disposed <sup>6</sup>	- 67,620
(25)	Postconsumer Paper Disposed	11,293,258
(26)	Moisture Content Adjustment (12% moisture)	x .8789
(27)	1990 Adjusted California Paper Disposal	9,925,644

### 1990 CALIFORNIA POSTCONSUMER PAPER GENERATED

(28)	1990 Total California Paper Generated: [(22) + (27)] =	12,992,330
------	---	------------

## **PRELIMINARY 1996 CALIFORNIA POSTCONSUMER PAPER UTILIZATION RATE (U.S. tons)**

### 1996 CALIFORNIA POSTCONSUMER PAPER RECOVERED (Numerator)

#### Preconsumer Scrap Factoring

(1)	U.S. New Supply Paper/Paperboard	94,384,000
(2)	Preconsumer Scrap as % of New Supply	X 9.405%
(3)	Tons Preconsumer Scrap Generated	8,876,815
(4)	% of Preconsumer Scrap Recovered	X 94.22%
(5)	Tons Preconsumer Scrap Recovered	8,363,735
(6)	Total U.S. Recovered Paper	+ 42,747,000
(7)	Preconsumer Scrap Recovered as % of Total Paper Recovered	= 19.57%

#### Mill Consumption

(8)	1996 Mountain & Pacific (M&P) States Mill Total Paper Consumption	5,838,100
(9)	Preconsumer Scrap as Percentage of M&P States Mill Total Paper Consumption <sup>7</sup>	X 19.57%
(10)	1996 Preconsumer Scrap Consumed at M&P States Mills	1,142,263
(11)	1996 M&P States Mill Postconsumer Paper Consumption: [(8) - (10)] =	4,695,837
(12)	M&P State Paper Mill Postconsumer Paper Consumption Originating from California, (based on population only): (11) X $\frac{31,878,234}{56,732,739}$ (Calif. Population) = 56,732,739 (M&P States Pop., less AK & HI)	2,638,600

<sup>5</sup> CIWMB "Interim Database", revised 11-17-95. The Interim Database is a compilation of waste composition data from California city & county Source Reduction & Recycling Elements.

<sup>6</sup> See Attachment 2 of Board Agenda Item 50, June 26, 1996, for a step-by-step calculation of the amount of preconsumer scrap disposed in California.

<sup>7</sup> This step assumes the same percentage as identified in Step 7, above.

- (13) M&P State Paper Mill Postconsumer Paper Consumption  
Originating from California, (based on both population &  
recycling infrastructure):

$$[(12)] \times \left[ .5 \frac{(CC_{CA}/CC_{MP})}{(P_{CA}/P_{MP})} + .5 \frac{(MC_{CA}/MC_{MP})}{(P_{CA}/P_{MP})} \right] =$$

where:  $MPMC_{CA}$  = CA recovered paper consumed at Mountain & Pacific  
State mills (estimate, based on population)  
 $CC_{CA}$  = CA population served by curbside recycling  
 $CC_{MP}$  = Mountain & Pacific States population served by  
curbside recycling  
 $P_{CA}$  = CA population  
 $P_{MP}$  = Mountain & Pacific States population (less AK & HI)  
 $MC_{CA}$  = California mill consumption of postconsumer paper  
 $MC_{MP}$  = Mountain & Pacific States mill consumption of  
postconsumer paper

$$2,638,600 \times \left[ .5 \frac{(20,882,000/31,316,000)}{(31,878,234/56,732,739)} + .5 \frac{(1,925,462/4,703,757)}{(31,878,234/56,732,739)} \right] =$$

$$2,638,600 \times [ .5 (.667/.562) + .5 (.409/.562) ] =$$

$$2,638,600 \times [ (.5 \times 1.187) + (.5 \times .728) ] = 2,638,600 \times (.594 + .364) =$$

$$2,638,600 \times .958 = 2,527,779$$

#### Alternative Products

- (14) 1996 California Postconsumer Recovered Paper  
Utilized in Alternative Products =

$$AP_{US} \times P_{CA}/P_{US} =$$

where:  $AP_{US}$  = U.S. consumption of paper in alternative products  
 $P_{CA}$  = California population  
 $P_{US}$  = U.S. population

$$1,030,000 \times 31,878,234/265,283,783 = 1,030,000 \times .12 = 123,772$$

#### Exports

(15) 1996 Total California Recovered Paper Exports	2,235,600
(16) Percentage of California Paper Exports Originating Outside of California <sup>8</sup>	X 15%
(17) Recovered Paper Exports Originating outside of California	335,340
(18) Recovered Paper Exports Originating within California: [(15) - (17)] =	1,900,260
(19) Preconsumer Scrap as % of Recovered Paper Exports Originating in California <sup>9</sup>	X 19.57%
(20) Preconsumer Paper Exports Originating Within California	371,881
(21) Postconsumer Paper Exports Originating Within California: [(18) - (20)] =	1,528,379

#### 1996 California Postconsumer Paper Recovered

(22) 1996 California Postconsumer Paper Recovery = [(13) + (14) + (21)] =	4,179,930
--	-----------

<sup>8</sup> As estimated by Board staff, based on informal survey  
of seven major paper exporters in state.

<sup>9</sup> Assumes the same percentage calculated in Step 7

1996 CALIFORNIA POSTCONSUMER PAPER GENERATED (Denominator)

(23) 1990 CA Postconsumer Paper Generation = 12,992,330  
(see Step 28 under "1990 California Postconsumer Paper Generated")

(24) 1996 CA Total Paper Generation (extrapolated from 1990 figure):

$$1996 \text{ Generation} = (23) \times (\%E_{96/90} + \%RS_{96/90}/\%CPI_{96/90} + \%P_{96/90} + \%PP_{96/90})/4 =$$

where:

$E_{96}$	=	1996 California Civilian Employment
$E_{90}$	=	1990 California Civilian Employment
$RS_{96}$	=	1996 California Retail Taxable Sales
$RS_{90}$	=	1990 California Retail Taxable Sales
$CPI_{96}$	=	1996 U.S. Consumer Price Index
$CPI_{90}$	=	1990 U.S. Consumer Price Index
$P_{96}$	=	1996 California Population
$P_{90}$	=	1990 California Population
$PP_{96}$	=	1996 U.S. Paper & Paperboard Production
$PP_{90}$	=	1990 U.S. Paper & Paperboard Production

$$1996 \text{ Gen.} = (23) \times \{E_{96}/E_{90} + (RS_{96}/RS_{90} \div CPI_{96}/CPI_{90}) + P_{96}/P_{90} + PP_{96}/PP_{90}\}/4 =$$

$$12,992,330 \times \{[14,469,900/13,846,000] + (205,712,248,000/181,655,000,000 \div 152.0/130.7) + (31,878,234/29,904,000) + (92,088,000/80,455,000)\}/4 =$$

$$12,992,330 \times [1.045 + (1.13 \div 1.163) + 1.066 + 1.145])/4 =$$

$$12,992,330 \times (1.045 + .972 + 1.066 + 1.145)/4 =$$

$$12,992,330 \times (4.228/4) = 12,992,330 \times 1.057 =$$

13,732,892

PRELIMINARY 1996 CALIFORNIA POSTCONSUMER PAPER UTILIZATION RATE

(25) Preliminary California Postconsumer Paper  
Utilization Rate:

$$[(22)/(24)] = 4,179,930 / 13,732,892 =$$

30.44%